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TO: AIAM Environment & Energy Subcommittee

FROM: John M. Cabaniss, Jr.  
Director, Environment & Energy

RE: **FORD CORPORATE CITIZENSHIP REPORT -  
Excerpts on Environment and Energy Issues**

Attached are excerpts from the Ford Corporate Citizenship Report on

- 1) Climate change;
- 2) Fuel economy;
- 3) Emissions

The full report has been requested.



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## Changing Our Approach to a Changing Climate

## Ford's Evolving View

When climate change emerged as a significant public policy issue in the early 1990s, we were skeptical of the scientific evidence suggesting that human activity made a major contribution to climate change.



Bill Ford discussed Ford's changing perspectives on climate change at the fifth Annual Greenpeace Business Conference in London in October 2000.

Competition-driven change is the best hope for moving quickly and effectively to address this issue. Along with energy companies, automakers and others, we questioned the science of climate change. However, in the mid-1990s, we supported other measures that would encourage the development and use of fuel-efficient cars such as an increase in the gasoline tax and investment in research and development of advanced technology to improve fuel economy.

## We Started Listening

In the late 1990s, as scientific information accumulated, our stance on climate change began to shift significantly. For example, led by our European operations, we played a significant role in the first major European Union voluntary industry sector agreement that will cut CO2 emissions from automobiles sold in Europe by 25 percent from 1995 levels by 2008. In Australia, we were the first auto manufacturer to submit a voluntary greenhouse gas reduction plan under the government's Greenhouse Challenge.

## We Expanded Our Response in 2000

During the past year, we embarked on a process, informed by our stakeholders, of turning the climate change issue inside out, looking at it as an opportunity, as well as a fundamental challenge to our culture and way of doing business. Senior executives have made very clear their belief that the issue is real. The Company has moved to a position where we see climate change - and our response to it - as a key component of our long-term business strategies.

During 2000, we built on our initial efforts to reduce greenhouse gas emissions and strengthened our programs to monitor and conserve energy in our operations. We began to benchmark leadership company practices on climate change. We reached out to a range of stakeholders including the Union of Concerned Scientists, World Resources Institute, CERES and Greenpeace to learn their perspectives on climate change.

"I believe there is now more than enough evidence of climate change to warrant an immediate and comprehensive - but considered - response. Governments will have a role to play in the change process. I'm not dismissing global treaties and their potential to generate action, but I believe there's a better way. Transparency, stakeholder engagement and accountability with real performance measures and standards will be the real regulatory tools of the 21st century and consumers will be the real

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**regulators."**

- Bill Ford, Greenpeace Business Conference, October 5, 2000

We announced a commitment to improve the fuel efficiency of our U.S. sport utility vehicle fleet by 25 percent within five years. A hybrid-electric version of our Escape compact sport utility vehicle, planned for 2003, will use advanced technologies to achieve significant improvements in fuel efficiency.

To advance our understanding of climate change mitigation, Ford has sponsored research for several years at MIT, Columbia and the University of Michigan. Recently we joined BP and Princeton University to collaborate on research on viable and practical solutions to carbon mitigation concerns. Ford has pledged \$5 million over ten years to support this research.

While these steps are important, we recognize that they are just a beginning. We also recognize that further progress in the fuel economy performance of our vehicles is necessary. This reality, along with stakeholder input, has reinforced our belief that we must now develop a comprehensive business- and market-focused strategy to address climate change.

**The Road Ahead**

Following the Emerging Issues Dialogue, a team of senior executives - including the vice presidents of Governmental Affairs, Global Product Development and Quality, Research and Vehicle Technology and Ford of Europe - were asked to explore global climate change as a strategic issue. The executives are supported by a team from across our business units that will work together during 2001 to develop a strategy that addresses our role in the public policy process, as well as our own greenhouse gas emissions. In developing the strategy, we will:

- Work with our employees to ensure they understand that climate change is an important issue across all of our business units.
- Explore opportunities for learning from and working with our business partners to reduce greenhouse gas emissions in a mutually rewarding way.
- Work cooperatively with the auto sector and other businesses.

The internal review process to set the strategy will address:

- *Establishing a climate change inventory and baseline for the Company* for accurately assessing current conditions and tracking future changes. This is essential to effective management.
- *Considering a range of possible measures* for reducing greenhouse gas contributions from its products, manufacturing and other activities.
- *Developing a broad set of short- and long-term strategic options* to reduce and mitigate our greenhouse gas emissions, including using renewable energy sources and working with suppliers to lessen the climate impacts of Ford activities throughout our value chain.

**We are developing a comprehensive business response to climate change - one that involves our operations, our investments in new technologies and our public policy positions.**

**Practical Realities**

Implementing our strategy will not be easy. We already have found the going tough. Some of the challenging issues we must address include:

- The markets for some of the most interesting new technologies that will help reduce emissions hardly exist at this point. How can we help create these markets?
- There are many steps we can take to further reduce CO2 emissions from our products and operations. How do we select our starting points, and how do we strike the right balance for our customers between these actions over time?
- Our product development process takes up to five years, so in the normal course of business, the effects of our new focus on reducing our climate impact will not be evident right away. How can we accelerate the process of changing our products to meet our priorities?
- Complex economic and social forces affect patterns of land use, vehicle use and fuel prices that in turn influence the potential for climate change.

How much and what influence can we have in addressing this complex web of social sectors and issues?

- Real progress will require cooperation and collaboration with our many thousands of suppliers. How do we approach taking a sensible action plan?
- How can our actions to address climate change create value for shareholders as well as society to ensure they support leadership actions?
- Should we concentrate our efforts in the developed world - the focus of most climate change policy processes - or across our global operations?

We know that our stakeholders, business partners and employees have views on these challenges, and we will listen to them and learn from them. We are confident we will rise to these challenges. Our shift on this issue was far too slow for some of our critics. And for some in industry, it seems far too swift. We recognize our importance to the issue of climate change - to one of the world's great concerns. And we see the opportunity before us to be a leading force in bringing about solutions.

There will be many ways to judge Ford in this first decade of the 21st century, many measures of success. None will be greater than our response to the issue of climate change.

#### Initial Estimates of Ford's Climate Change Emissions

As we begin an effort to understand and reduce our greenhouse gas emissions, we need to quantify those emissions for two purposes - to estimate the magnitude of our contribution to the issue and to track our emissions with enough accuracy and detail to manage them effectively.

For the first purpose, we estimated the yearly greenhouse gas emissions from all Ford Motor Company vehicles on the road, based on our market share and Intergovernmental Panel on Climate Change figures for the contribution of road vehicles to anthropogenic (human-caused) greenhouse gas emissions. Combined with an estimate of CO<sub>2</sub> emissions from our manufacturing facilities<sup>1</sup> this totals approximately 400 million metric tons of CO<sub>2</sub> equivalent, which we consider a rough estimate of yearly greenhouse gas emissions from Ford's plants and products.<sup>2</sup> Of the total, a small fraction - about 3 percent - results from our manufacturing activities in any one year. The vast majority results from Ford vehicles on the road.<sup>3</sup> Because many assumptions are required to generate such a figure, and we do not control all of the factors that influence its magnitude, we do not expect to use this estimate as an ongoing performance measure.


For the purpose of tracking and managing our greenhouse gas emissions, we have joined with the World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD) to act as a road tester of a greenhouse gas measurement and reporting protocol. The protocol was developed with extensive input from businesses and advocates alike and is intended to become the standard methodology for climate change inventories. The road test will help us develop a more complete inventory of our greenhouse gas emissions and refine it over time. We will also participate in a working group with WRI, WBCSD, companies and other stakeholders to develop and apply methods for estimating life cycle impacts of our products.

<sup>1</sup> Preliminary estimate that includes direct (on site) and indirect (purchased power) greenhouse gas emissions.

<sup>2</sup> Includes greenhouse gases generated by operating Ford facilities and products. Does not include emissions from suppliers, supplier-owned or Ford-owned transport.

<sup>3</sup> Based on 1999 global fleet average fuel economy data, estimated vehicle miles traveled and refrigeration, N<sub>2</sub>O and CH<sub>4</sub> emissions

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Rajendra Pachauri on Climate Change

Chairman Bill Ford has rightly stated that there is "sufficient evidence to make a decision, to take action" on climate change.



Rajendra (Patchy) Pachauri, Ph.D., is the Director of TERI (Tata Energy Research Institute), the largest environmental and energy non-profit institute in the developing world. He is Vice Chairman of the IPCC (Intergovernmental Panel on Climate Change).

Ford Motor Company's business is likely to grow substantially in the developing world where transportation systems will undergo major expansion and modernization that can affect the world's climate system. A commitment to mitigate greenhouse gas emissions makes it imperative for Ford to develop low carbon-intensive transport systems. The IPCC Third Assessment Report found that climate change is taking place faster than estimated five years ago in the Second Assessment Report, and that the impact of climate change on the developing countries would be far worse than that estimated to occur in the developed world. The world and the developing countries urgently need low carbon energy transport strategies. I would like to see the Company make a firm commitment worldwide and, particularly, in developing-country markets for reducing air pollution, including greenhouse gas emissions in the vehicles and equipment they produce.

**Ford Motor Company's business is likely to grow substantially in the developing world where transportation systems will undergo major expansion and modernization that can affect the world's climate system.**

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## Bob Massie on Climate Change

Though there will always be a small minority of people who prefer a comforting illusion to an unpleasant truth, the dangers of climate change are not only real but constitute the most serious long-term threat the human species has ever faced.

Robert Kinloch Massie is the Executive Director of Coalition for Environmentally Responsible Economies (CERES), a lifelong political activist and an award-winning author.

Temperatures and sea levels are rising; the polar caps and glaciers are melting; storms and natural disasters are increasing; whole species and ecological systems are being wiped out. Our grandchildren will judge us by the manner in which we understood, accepted and met this danger.

The question confronting Ford Motor Company is momentous: How should one of the biggest companies in the world respond to one of the biggest problems in the world?

Ford Motor Company must:

- Rethink its core mission, message and strategy in light of the new physical realities created by climate change.
- Break the silence by describing the dangers and opportunities of the new reality through every one of its communication channels.
- Reject the "blame game" in which consumers, companies, governments and investors all point the finger at each other for the failure to rethink and restructure our carbon economy. To do so, Ford Motor Company should commit to seriously and rapidly achieve climate-neutral targets for all of its facilities and products. To help make up for the precious time lost from its earlier opposition to any government action, Ford Motor Company should lobby in favor of aggressive national and corporate greenhouse reduction requirements.

The question confronting Ford Motor Company is momentous: How should one of the biggest companies in the world respond to one of the biggest problems in the world?

- Enlist and enable active support for the battle against climate change from all of its networks - customers, dealers, suppliers, external stakeholders, competitors, host governments and employees.

This battle has the potential to create more opportunities, more excitement and more commitment to the Company than any conventional business strategy could imagine.

"Freedom lies in being bold," said Robert Frost. Henry Ford understood this when he created a new company based on new principles to meet the needs and realities of a new century. As Ford Motor Company enters its second century, it must do no less.

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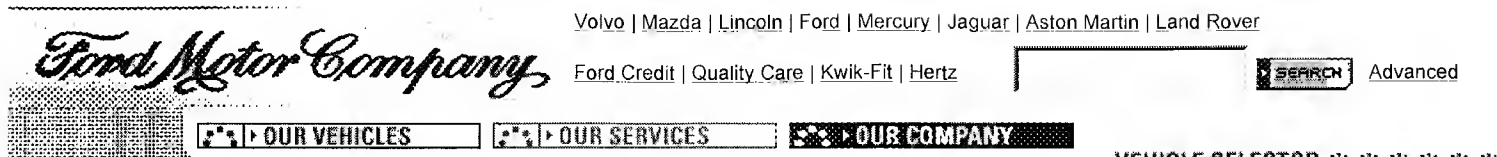
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## Reducing Energy Use to Cut Our Greenhouse Gas Emissions

Improving the Fuel Economy of Our Products Is Fundamental, but not Fast

Improving the fuel economy of our products is increasingly important to Ford in light of our commitment to addressing global climate change issues and our customers' concerns about rising fuel prices. Ford has particular challenges in raising its fleet-fuel efficiency for several reasons:

- Some of our most popular products are light trucks including SUVs and pickups that are designed to handle hauling and towing and use more fuel than smaller vehicles. Ford's top selling product worldwide, for example, is the F-150 pickup truck. It also is the best-selling vehicle in the world.
- Over the last 10 years or so, Ford has pursued a business strategy of broadening its offerings to cover a variety of market segments. Its acquisition of Aston Martin (1987), Jaguar (1989), Volvo (1999) and Land Rover (2000) to form the Premier Automotive Group have added relatively large luxury vehicles to Ford's line-up.
- Compared to some consumer product industries, product cycle times in the auto industry (the time it takes to bring a new product to market) are long, up to four or five years.

Our progress in improving the fuel economy of our products has been mixed. In Europe, where high fuel prices and consumer concern have driven competition toward more fuel-efficient vehicles, Ford's products have improved markedly. In the United States, where fuel economy has historically been a less important factor in consumer purchases, Ford products' average fuel economy has met regulatory requirements but generally not exceeded them.

**Continuing to improve the fuel economy of our products will be an important focus for Ford over the next several years.**

During 2000, however, Ford committed to significantly increasing its rate of progress in improving fuel economy. In July, Jacques Nasser announced Ford's plans to improve the average U.S. fleet-fuel economy of its SUVs by 25 percent from 2000 by 2005. A variety of means, discussed on the following page, will be used to achieve this goal.

Our 2000 Performance - Fuel Economy and CO2 Emissions  
Because of the close link between fuel consumption and CO2 emissions, our performance in addressing those issues is discussed together in this section.<sup>1</sup>

Ford's U.S. corporate average fuel economy (CAFE) for model year 2000 improved 1.3 percent compared to model year 1999, due in part to the introduction of the Ford Focus (see Figure 1). However, Ford's average fuel economy is expected to decline slightly for the 2001 model year. CAFE is sensitive to changes in the models offered because it is calculated as an average of the fuel economy of vehicles sold. The 2001 model year trend is due largely to two such changes: the discontinuation of the Ford Contour and Mercury Mystique (relatively fuel efficient cars), and the acquisition of Land Rover, whose vehicles are now included in Ford's figures. We expect to see improvements in the fuel economy of our vehicles over the next several years as planned improvements appear in new and redesigned vehicles. The average CO2 emissions of our vehicles follow the same trends (see Figure 2).

## FORD U.S. CORPORATE AVERAGE FUEL ECONOMY

Model Year	91	92	93	94	95	96	97	98	99	00	01
Fuel Economy (mpg)	18.5	19.0	19.5	20.0	20.5	21.0	21.5	22.0	22.5	23.0	23.5

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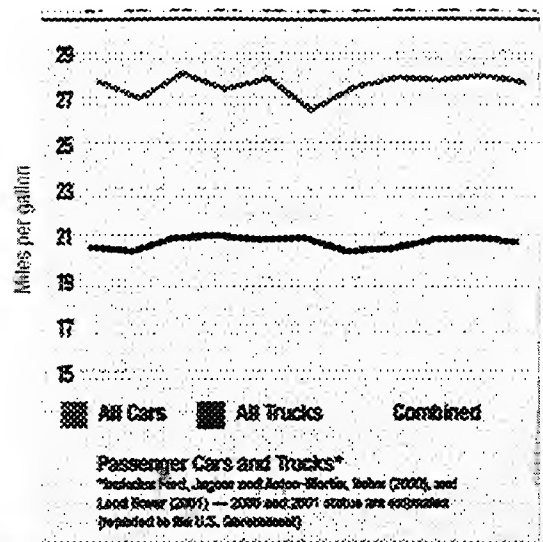


Figure 1

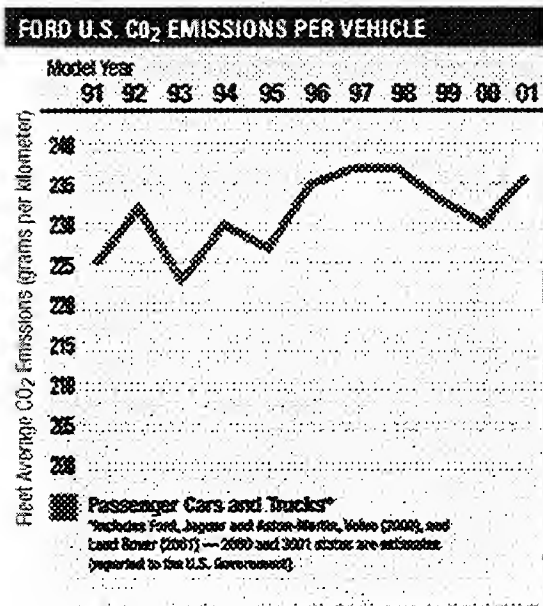
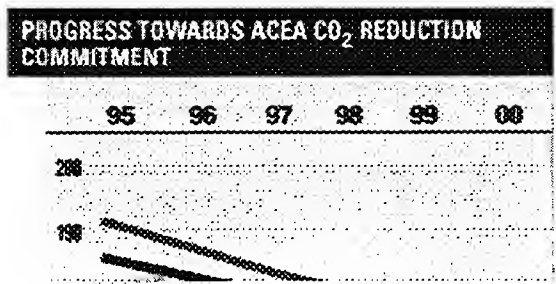


Figure 2

In Europe, Ford continues to make progress toward an industry-wide voluntary commitment to cut the average CO2 emissions of new vehicles sold in Europe by 25 percent by 2008, compared to 1995 levels. This requires cutting fuel consumption proportionately. The overall goal under the agreement between the European Association of Automobile Manufacturers (ACEA) and the European Commission is to achieve average CO2 emissions of 140 grams per kilometer by 2008.

We have made considerable progress toward the goal. Since 1995, the combined Ford, Jaguar and Aston Martin fleets have reduced CO2 output by an average of 10.6 percent (see Figures 3 and 4). Over the same period, Volvo and Land Rover have cut CO2 emissions by 11.1 percent and 11.9 percent, respectively.



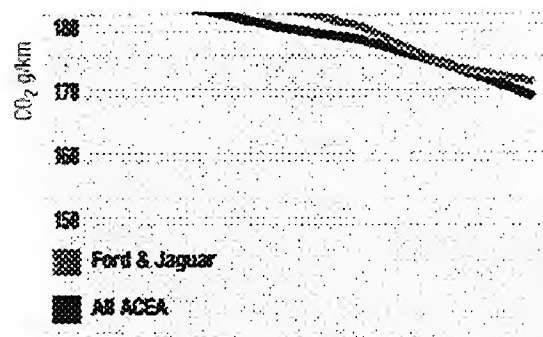


Figure 3

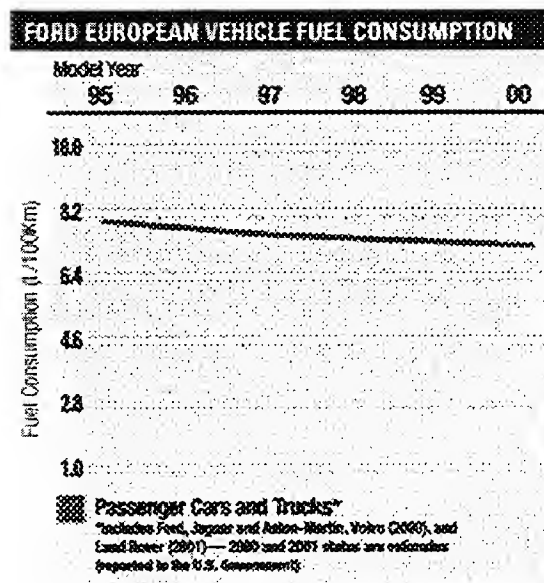


Figure 4

After many years during which the gasoline-powered internal combustion engine was undisputed king of automotive engines, the next five years will see a proliferation of new technologies. A key feature of these new technologies will be dramatically improved fuel efficiency.

#### We're Addressing Energy Use at Our Manufacturing Facilities

Ford's production facilities, offices and other properties use a variety of energy sources including electricity, natural gas, propane, oil and coal. A small proportion of energy is self-generated (see Table 1). For example, Ford's Twin Cities Assembly Plant in Minnesota uses hydroelectric generation to power the plant and sells excess electricity to the power grid. Jaguar's Brown's Lane Plant uses a highly efficient combined heat and power (CHP) plant to provide heat, process energy and electricity to the facility. A similar system is planned for Jaguar's Halewood facility.

SELF-GENERATION FACILITIES			
Facility	Capacity (MW)	Energy Produced (MWh)	Energy Consumed (MWh)
Blue Oval Plant (Detroit, Michigan)	1.0	1.0	1.0
Blue Oval Plant (Detroit, Michigan)	1.0	1.0	1.0
Blue Oval Plant (Detroit, Michigan)	1.0	1.0	1.0
Blue Oval Plant (Detroit, Michigan)	1.0	1.0	1.0
Blue Oval Plant (Detroit, Michigan)	1.0	1.0	1.0
Blue Oval Plant (Detroit, Michigan)	1.0	1.0	1.0
Blue Oval Plant (Detroit, Michigan)	1.0	1.0	1.0
Blue Oval Plant (Detroit, Michigan)	1.0	1.0	1.0
Blue Oval Plant (Detroit, Michigan)	1.0	1.0	1.0
Blue Oval Plant (Detroit, Michigan)	1.0	1.0	1.0

Windsor Plant (Windsor, Ontario, Canada)	30	94
---------------------------------------------	----	----

Table 1

Ford's energy use increased 1.9 percent on a production-normalized basis<sup>1</sup> during 2000, compared to a reduction target of 2.25 percent for the year (see Figure 5). Overall energy use increased 1.0 percent per vehicle (see Figure 6). CO<sub>2</sub> emissions increased in proportion (see Figure 7). To reverse a two-year trend of increasing energy use, Ford business units agreed to a five-year program of efficiency improvements to cut energy use by 14 percent on a production-normalized basis by 2005.

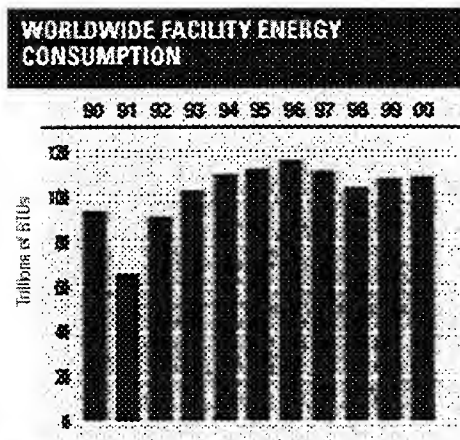


Figure 5

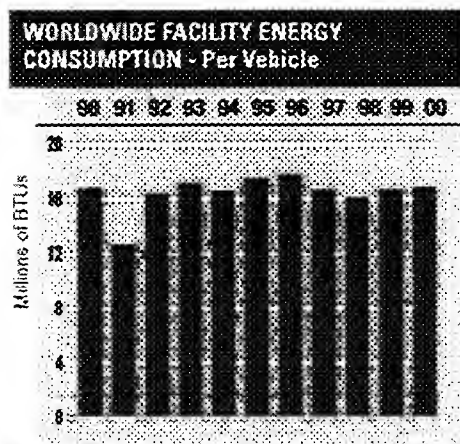


Figure 6

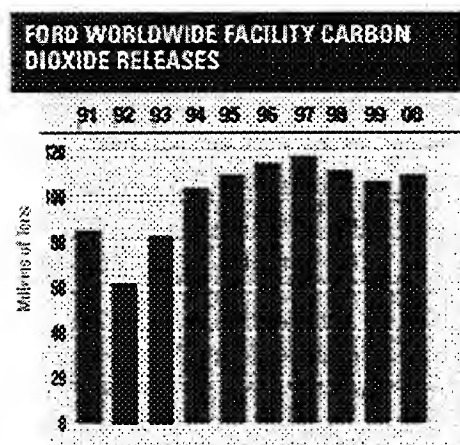


Figure 7

The figures for 5, 6 & 7, include Visteon. Exclude Volvo, Jaguar and Aston Martin.

For this report, a detailed breakdown of energy sources is not available. However, as we develop an independently reviewed inventory of our

greenhouse gas emissions (see [Changing Our Approach to a Changing Climate](#) for more detail), we will provide additional information, and the estimate of our facility energy use and CO2 emissions will be refined considerably.

An energy management department of Ford Land Services Corporation, which develops and manages Ford properties, helps identify and implement projects to reduce energy use.

For example, during 2000, the Chicago Assembly, Chicago Stamping and Kentucky Truck plants completed renovations to their heating and air conditioning systems that will save a total of \$5.9 million or 1.3 trillion BTUs per year. Three more projects are under construction. When completed, the projects will save \$20 million worth of energy and 4.4 trillion BTUs each year.

Another project at eleven North American facilities has cut electricity consumption by 17.5 million kilowatt-hours per year by installing high-efficiency lighting in paint shops. Other initiatives have sought to optimize air compressor use. Ford's Woodhaven Stamping Plant saved nearly eight million kilowatt-hours per year worth \$400,000 through a series of improvements to its air compressor system.

These experiences confirm our philosophy that there can be a synergy between business and environmental success.

#### Moving Things Around Takes Energy, Too

For the most part, Ford does not own the transportation systems that move parts, materials and finished products to and from its plants and does not actively manage the resulting environmental impacts. Indirectly, by asking its suppliers to implement and certify environmental management systems, Ford encourages its suppliers to address those impacts.

Trends in transportation to and from Ford plants are mixed. As the Company becomes more globally integrated, parts may be shared across global platforms and thus transported long distances to assembly plants. On the other hand, Ford has begun encouraging suppliers to locate adjacent to its plants.

Ford's Cologne, Germany, plants transport 80 to 90 percent of their products via the River Rhine on barges that have 45 times the capacity of trucks. Following shipping, the majority are then transferred to their next destination by train.

Jaguar's Halewood plant redevelopment chose rail transportation to ship finished automobiles to markets and ports.

The Rouge reinvestment, however, chose not to use rail transportation. These trends and counter-trends mirror changes in the larger framework of mobility issues moving into the 21st century.

<sup>1</sup> For internal combustion vehicles, emissions of CO2 (the predominant human-caused greenhouse gas) are proportional to that part of the combustion energy derived from the carbon content of the fuel. Thus, reducing fuel consumption increases fuel economy and reduces CO2 generation. In this report, fuel economy - the standard U.S. measure - is expressed in miles per U.S. gallon (mpg). Fuel consumption - the standard European measure - is expressed in litres per kilometer (L/km), while CO2 generation is expressed in grams per kilometer (g/km).

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Partnering with Suppliers to Achieve Our Environmental Goals

Do We Nurture Nature?

Compliance with Laws and Regulations is Fundamental

Ford Research Lab Celebrates Its 50th Anniversary

## SUV Update

In the 1999 Ford Motor Company Corporate Citizenship Report, we presented a case study review of the issues surrounding SUVs.



Beginning in 2003, Ford will offer hybrid Escapes to achieve an improvement in fuel efficiency.

The review touched on the emergence of the SUV market, its significance to Ford's business success and the dilemmas that Ford's success in the SUV market present for its corporate citizenship strategy. It recognized stakeholder concerns about issues of safety, tailpipe and greenhouse gas emissions and appropriate use of the vehicles. Those two pages of the report spawned considerable controversy, headlines in dozens of newspapers including *The New York Times* and *Wall Street Journal* and coverage by other major news media.

We were frankly taken aback by the reaction to the set of seemingly obvious statements in the SUV case study. Within Ford and its affiliates, there were differing views about the value of the case study. While it generated a lot of useful discussion about the issues raised, Ford's dealers, in particular, were concerned about seemingly negative comments regarding an important product line.

The case study noted our intention to address certain stakeholder concerns about SUVs, and we took a number of steps during the year to do so.

In late July 2000, Ford announced a program to improve the average fuel efficiency of its U.S. SUV fleet by 25 percent over the next five years. Ford will use a suite of engine, transmission and vehicle design advances to achieve this goal. While no single technology will be responsible for the majority of that gain, each advance will make a significant contribution.

### We were frankly taken aback by the reaction to last year's case study.

The hybrid version of the Escape announced for production in the 2003 calendar year will contribute to this goal. It will use gasoline and electric motors to achieve up to 40 mpg in stop-and-go city driving and travel up to 500 miles on a single tank of gasoline. Ford is studying additional technologies for possible future use including fuel efficient five- and six-speed automatic transmissions and integrated starter-generators that shut the vehicle down at idle and restart it with no perceptible lag.

The estimated average fuel economy of Ford's 2001 model year SUVs improved by 6 percent relative to 2000 models, due largely to the introduction of the Ford Escape and Mazda Tribute. These compact SUVs get city fuel economy of 18 to 23 mpg, depending upon engine and transmission combinations.

Ford also introduced new safety features to its SUV models produced in

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2000, and, in January of 2001, announced a comprehensive set of additional SUV safety features, discussed in [Contributing to a Safer and Healthier World](#).


All of Ford's SUVs meet the relevant Low Emission Vehicle standards for their vehicle class. In the United States, the Ford Expedition and Excursion and the Lincoln Navigator are not required to meet LEV standards until 2004 (see [Cutting Emissions to Curb Our Impact](#) for further discussion).

We recognize that stakeholder interest in SUVs is, if anything, higher than it was a year ago. We will continue to address issues associated with SUVs, track performance against the SUV fuel economy goal and report on our progress.

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OUR VEHICLES

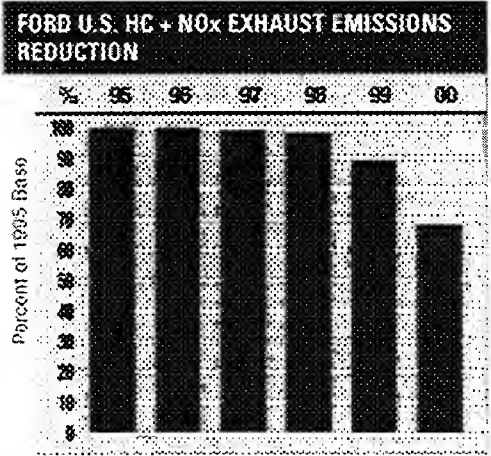
OUR SERVICES

OUR COMPANY

## Cutting Emissions to Curb Our Impact

The manufacturing and use of motor vehicles results in a variety of emissions at all stages of the life cycle including emissions to air, water and land (through waste disposal). Because of the close relationship between CO2 emissions and energy use, we discuss CO2 emissions in the energy section of this performance review found in [Reducing Energy Use to Cut Our Greenhouse Gas Emissions](#). This section addresses emissions other than CO2 from our vehicles and manufacturing facilities.

We Cut Emissions from Our Vehicles Ahead of Regulatory Schedules In the United States and Europe, we have moved to implement emissions reductions ahead of regulatory schedules. This action is equivalent to eliminating the smog-forming emissions from 350,000 full-size trucks on the road today. In the United States, Ford voluntarily upgraded its SUVs and F-series pickup trucks to meet low emission vehicle standards from one to five years ahead of schedule. Ford also has certified the 2001 Windstar minivan to the even cleaner Ultra Low Emission Vehicle (ULEV) standards. We have sold more than 2.6 million vehicles that have from 43 to 50 percent less hydrocarbon and oxides of nitrogen emissions than allowed. This has contributed to an overall drop of 30 percent in our U.S. 2000 model year vehicle emissions compared to 1995 (see Figure 11).



Year	Percent of 1995 Basis
95	100
96	95
97	90
98	85
99	80
00	70

Figure 11

VEHICLE SELECTOR

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In Europe, Ford began offering vehicles that meet Stage IV emission standards scheduled to take effect in 2005. By the final quarter of 2000, more than 25 percent of passenger car production for sale in Europe met Stage IV emission levels - fully four years ahead of requirements. Helping fuel consumer interest in the vehicles, some EU member states are offering significant tax incentives to consumers for the purchase of vehicles that meet the 2005 standards early.

**Our emissions reductions are equivalent to eliminating the smog-forming emissions from 350,000 full-size trucks on the road today.**

We also introduced the Eco-label in most European countries and several others in 2000 (see [Ford of Europe](#)). The label, affixed to all new automobiles, provides consumers with a clear, concise statement of the vehicle's conventional and CO2 emissions and its fuel economy and safety ratings. In the United States, we have been working with the EPA towards a comprehensive consumer rating system for new vehicles.

#### Vehicles and Fuels Work as a System

Clean fuels are vital to achieve the full benefits of the advanced emissions equipment we use on our vehicles. Cleaner fuels also would improve the emissions of vehicles already on the road. Europe, Japan and Canada all have mandated low sulfur levels in fuel. The U.S. EPA has approved a gasoline sulfur level of 30 parts per million (ppm) - compared to today's average of more than 300 ppm in the United States - as part of its Tier Two program. The European Union has mandated low sulfur fuel of 50 ppm beginning in 2005. We believe that sulfur content in fuel must ultimately be reduced to 5-10 ppm maximum to permit the introduction of advanced engine technologies and to offer an appropriate return in terms of air quality. Ford is pressing for early availability of these fuels in Europe, over strenuous objections from some in the energy industry, to enable use of technology that gives both low emissions (European Stage IV) and reductions in CO<sub>2</sub> through reduced fuel consumption.

Another issue in some emerging markets is the use of leaded fuel, which precludes emissions control equipment such as catalytic converters. In India, Saudi Arabia, Vietnam and other countries, Ford has worked with governments and NGOs to advocate and develop plans to phase out leaded fuel.

#### We Actively Manage Emission Reductions from Our Manufacturing Facilities

Through the planning and management processes of our environmental management system, Ford facilities identify environmental aspects of their operations and address them to achieve continuous improvement. Improvement goals are set at the facility level. Examples of plant efforts include:

- Ford's Windsor Casting Plant, the largest iron foundry in Ontario, Canada, recycles 130,000 tons of iron and steel annually into one million cast iron engine blocks and 2.5 million crankshafts. The plant demonstrated the first industrial use of advanced ozonation technology to treat the organic compounds present in the plant's wastewater as a byproduct of the iron casting process.
- At the Cologne Merkenich plant in Germany, engineers are investigating ways to develop closed loop recycling of heavy metals in rinse water from a phosphating process. A recent study and pilot installation investigated the recycling of those heavy metals and thus, their elimination from the wastewater stream. Based on positive results from a pilot study, Merkenich SpareParts Production will install a nano-filtration unit in 2001 to completely recycle the heavy metal content from the rinsing water.
- The Ohio Assembly Plant replaced solvent-based cleaners used in maintaining paint booths with water-based cleaners, cutting VOC emissions by 87 percent.

Ford plants worldwide also have set goals for phasing out PCB-containing transformers. At the end of 1999, 76 percent of PCB-containing transformers had been removed; all such transformers are slated for removal by 2010.

**Since 1997, Ford's North American Assembly plants have cut assembly line waste per vehicle by 58 percent.**

#### But Performance Data Is Not Comprehensive

Through Ford's Total Waste Management Program, a partnership with waste management service suppliers aimed at reducing and better tracking and managing waste, Ford has established a waste classification and tracking program. When fully implemented, this program will provide detailed information on the generation and management of a comprehensive range of non-hazardous and hazardous wastes. A less complete measure of waste generated from assembly lines at North American assembly plants shows a 58 percent reduction since 1997 (see Figure 12). This reduction is due in part to a systematic effort to reduce packaging waste that is discussed on pages 54 and 55. In 1999, Ford's U.S. hazardous waste sent off-site for recycling, treatment or disposal, as reported to the U.S. EPA under the Biennial Reporting System, totaled 19,849 tons, a reduction of 14 percent from 1997 levels or 15 percent on a per vehicle basis.

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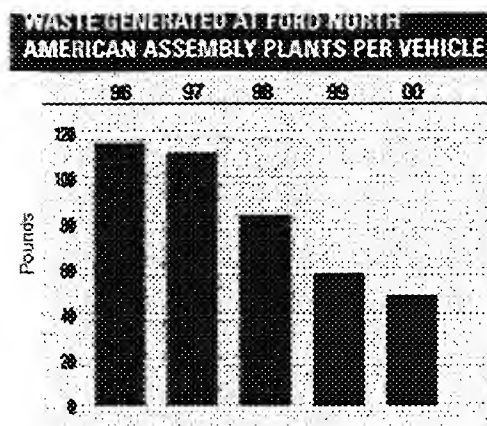


Figure 12

In the United States, Canada and Australia, Ford is required to report on a range of chemical emissions. While these data are an imperfect environmental indicator, they are readily available and often used to gauge a company's environmental progress. The U.S. Toxic Release Inventory (TRI)<sup>1</sup> requires certain manufacturing facilities to report the quantity of designated substances released, treated, recycled and used for energy recovery. Ford's total TRI releases and releases-per-vehicle are shown in Figures 13 and 14. Figure 15 shows the management of TRI releases and transfers while Figure 16 shows media to which TRI releases are made.

Canada's National Pollutant Release Inventory (NPRI)<sup>2</sup> is similar to TRI, although the list of chemicals and reporting thresholds differ from the U.S. TRI. Total and per-vehicle NPRI releases are shown in Figures 17 and 18.

Australia's first report to the National Pollutant Inventory covered the period from July 1999 to June 2000. Ford's releases of listed materials totaled 925,338 kilograms.

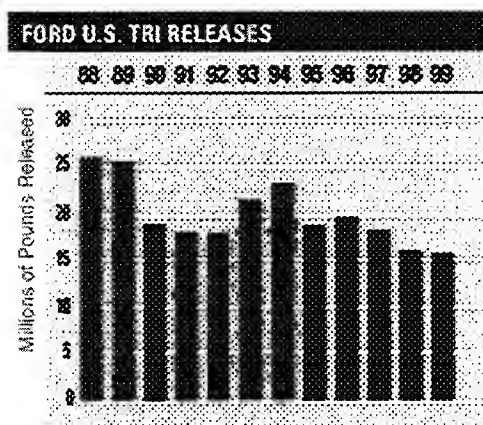


Figure 13

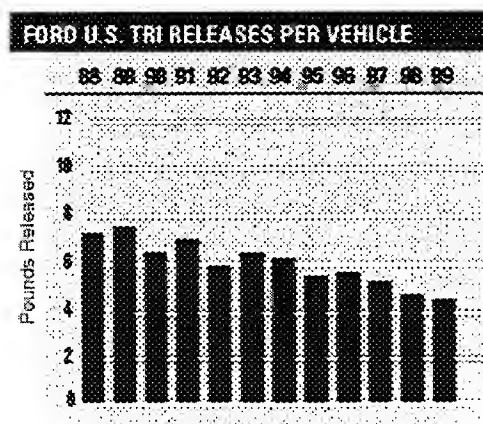


Figure 14

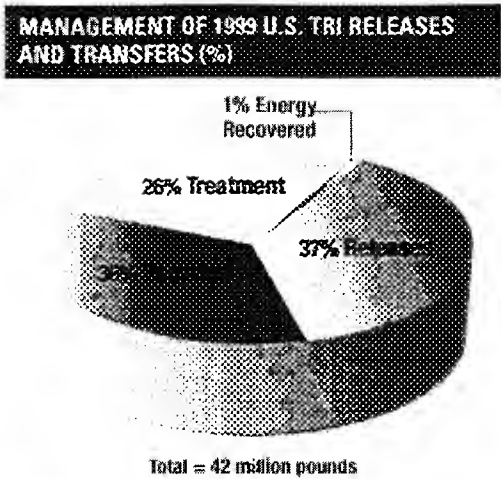


Figure 15

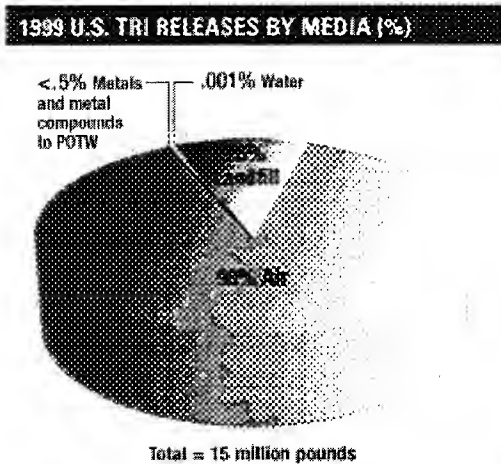


Figure 16

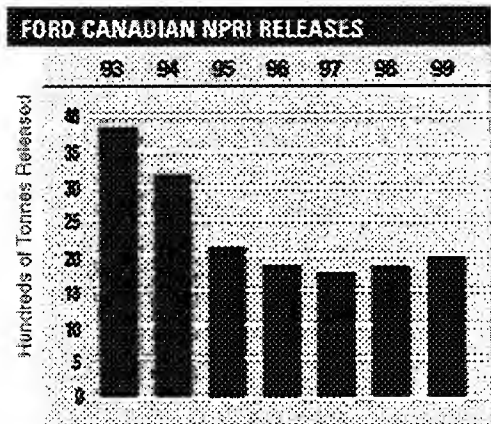


Figure 17

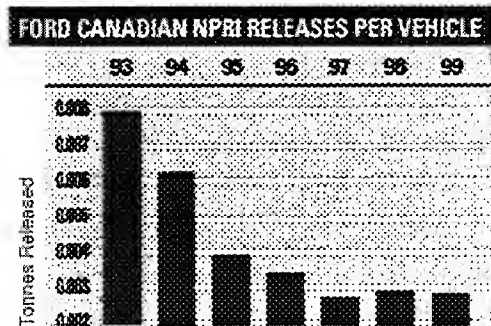




Figure 18

1 Releases are defined as any emissions or discharges to the environment and include: fugitive and stack air emissions, water discharges, discharges of metals and metal compounds to Publicly Owned Treatments Works (POTW) and land disposal. Data for current and prior years have been revised to exclude Visteon.

2 Releases are defined as any emissions or discharges to the environment and include: fugitive, stack and storage and handling air emissions, water discharges and land disposal. Data for current and prior years have been revised to exclude Visteon.

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Deborah Zeonke on Sustainable Mobility

Environmental Vehicle Update

Staying Connected Resources

## Environmental Vehicle Update

## Fuel Cell Electric Vehicles (FCEV)

- Delivered Focus FCEV to the California Fuel Cell Partnership for testing.
- Fuel cell electric vehicle production to begin by 2004.

## Hybrid Electric Vehicles (HEV)

- Ford Escape HEV, planned to be available in the United States in 2003, will be sold as *Maverick* in Europe.
- Announcement of higher-voltage (42-volt) electrical system on future Explorer that achieves breakthrough fuel economy and offers more high-tech comfort and convenience features.

## Battery Electric Vehicles (BEV)

- THINK *city* introduced across Europe: Rome, Amsterdam and London (early 2001).
- Hertz Europe added 40 new THINK *city*s to its fleet.
- THINK *city* used in Hertz car-sharing pilot in San Francisco; working to add 750 THINK vehicles to its U.S. operations over the next three years.
- THINK *neighbor* low-speed vehicle (late 2001).
- THINK electric bikes sold in the United States.
- Ranger BEV, highest volume electric vehicle in North America, sold in United States.
- 500 BEV postal vehicles delivered to U.S. Postal Service (mid 2001).

## Alternative Fuel Vehicles (AFV)

- Eleven AFVs offered in U.S. and Europe.
- Infrastructure issues: in Minneapolis, working with a coalition of organizations to add more than 50 E85 fueling stations in the Minneapolis/St. Paul metropolitan area. E85 is a blend of 85 percent ethanol and 15 percent gasoline. It can reduce carbon dioxide emissions by as much as 20 percent when compared to gasoline on a life-cycle basis.

In our 1999 report, we provided an in-depth look at our portfolio of our environmental vehicles and our plans for commercialization. Here's a brief look at our progress in 2000.

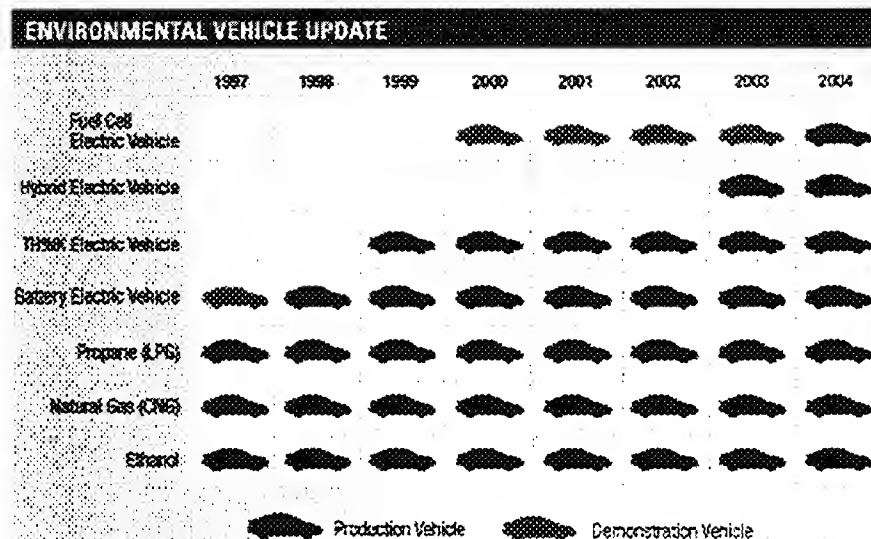


Figure 30

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